SUBSTITUTE FORM PTO-1449										ENT OF COMMERCE RADEMARK OFFICE	ATTY.	DOCKET NO 9).	SERIAL NO. 10/711,764		
	4	છું/	INF	OR	MA ME	TIOI NT	N D BY	ISCL APPI	OSURE LICANT		APPLICANT Toshiharu Furukawa et al.					
MAR 1.98(I	7 J 5008	(F)	Use	e se	vera	ıl sh	eet	s if ne	ecessary)		FILING Octobe	DATE r 4, 2004		GROUP 2823		
T& TR	ADEMAR	/							U.S. F	PATENT DOCUMENTS						
EXAMINER			D.A.			1 18 4	DEF		ISSUE DATE	PATENTEE	·	CLASS SUBC		2241	FILING DATE IF APPROPRIATE	
INITIAL	A.A	PATENT NUMBER 5 2 2 7 0 3 8						8	7/13/1993	Smalley et al.		204	173		10/4/1991	
). <u>).</u> 1	A.B	5	3	0	0	2	0	3	4/5/1994	Smalley		204	157.41		11/27/1991	
	A.C	6	7	0	6	4	0	2	3/16/2004	Rueckes et al.		428	408		4/23/2002	
-{	A.D	6	7	0	6	5	6	6	3/16/2004	Avouris et al.		438	132		5/13/2002	
	A.E															
	A.F															
	A.G															
	A.H										·					
	A.I										\geq		<u></u>			
	A.J															
	A.K									<u> </u>	<u> </u>		<u> </u>			
					FC	RE	IGN	PAT	ENTS OR PU	BLISHED FOREIGN PA		PPLICATION	IS 			
		DOCUMENT NUMBER						P	UBLICATION DATE	COUNTRY OF PATENT OFFI	ATENT OFFICE CLASS		SUBCLASS		TRANSLATION (YES/NO)	
	A.L	_		_				_								
	A.M			_	<u> </u>	<u> </u>	_									
	A.N															
	A.O			,												
	A.P							-			>					
	A.Q							<u> </u>								
					C	тн	ER	DOC	UMENTS (Inc	luding Author, Title, Dat	e, Place	of Publication	<u>,, </u>			
75	A.R	Hir	rata,	<u>U.</u> S	S. P	ater	t A	plica	tion Publication	on No. US 2004/O01813	<u>8 A1,</u> Pu	blication Date	e 1/29/20	004	<u> </u>	
	A.S	E. 10	T. M 3, N	liche lo. 2	elso:	n et 999	al.,) (p	<u>Solv</u> ages	ation of Fluorin 4318-4322)	nated Single-Wall Carbo	n Nanotu	bes in Alcoh	ol Solver	<u>nts</u> , J. Ph	nys. Chem. B, Vol.	
51	A.T	P., 37		oul (et al	., <u>R</u>	eve	rsible	Sidewall Fund	ctionalization of Buckytu	ibes, Che	mical Physic	s Letters	, 3 Septe	ember 1999, pp. 367-	
EXAMINER		-				/	-/	,	/	DATE CONS	SIDEREC					
)_	<i>E</i>				Z	_	<u>a_</u>	<u> </u>	mana Draw line three	SO/	n only if not	in confor	mance a	and not considered.	
Include a cop	nitial if ci	ratio	on a with	onsi h ne	aere xt c	omi	ทบก vne	iner c	n to applicant	mance. Draw line throu					sure Form (PTO-1449)	
												;	วนบรินเนิย	こしろはひら	OUI O FOITH (C 1 C 1943)	

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

B.R Bahr, Jeffrey L. et al., Covalent Chemistry of Single-Wall Carbon Nanotubes, J. Mater. Chem. 2002. 12. pp. 1952-1958

B.S E.T. Mickelson et al., Fluorination of Single-Wall Carbon Nanotubes, Chemical Physics Letters 296 (1998), pp. 188-194

B.T Cao, Anyuan et al., Direction-Selective and Length-Tunable In-Plane Growth of Carbon Nanotubes, Adv. Mater. 2003, 15, No. 13, July 4, pp. 1105-1109

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

SUBSTITUTE FORM PTO-1449 U.S. DEPARTMENT OF COMMERCO PATENT AND TRADEMARK OFFICE OF TRADEMARK OFFI												ATTY, DOCKET NO. IBM/319			SERIAL NO. 10/711,764			
/	ATEMENT BY APPLICANT													APPLICANT Toshiharu Furukawa et al.				
(37 CFR -3 ,98(AR J 4 (b))	2006		se	vera	al st	eet	s if ne	eœssary)			FILING Octobe	DATE r 4, 2004		GROUP 2823			
(A)	TRACE	ALPA							U.S. F	PATENT	DOCUMENTS							
EXAMINER INITIAL		PATENT NUMBER DATE PATENTEE											CLASS SUB		LASS	FILING DATE IF APPROPRIATE		
55	A.A	5	7	9	6	5	7	3	8/18/1998	Koteck	i et al.		361	321.5		5/29/1997		
	A.B	6	2	5	0	9	8	4	6/26/2001	Jin et a	ıl.		445 51			1/25/1999		
	A.C	6	4	2	3	5	8	3	7/23/2002	Avouris	s et al.		438 132			1/3/2001		
	A.D	6	5	1	5	3	2	5	2/4/2003	Farnwo	orth et al.		257 296			3/6/2002		
	A.E	6	8	5	8	8	9	1	2/22/2005	Farnwo	orth et al.		257 296			12/9/2002		
31	A.F	6	8	9	1	2	2	7	5/10/2005	Appen	zeller et al.		257 346					
	A.G		Γ															
	A.H	Τ																
	A.I																	
	A.J																	
	A.K																	
					FC	DRE	IGN	PAT	ENTS OR PU	BLISHE	FOREIGN PA	ATENT A	PLICATION	18				
		DOCUMENT NUMBER						P	UBLICATION DATE		UNTRY OR PATENT	CLASS		SUBCLASS		TRANSLATION (YES/NO)		
155	A.L	WO 2004/O40668					3	3/1	4/2004	PC1	-	H01L 51/20				Abstract Only		
	A.M	WO 2004/O40616						3/1	3/2004	PCT		H01L				Abstract Only		
-51	A.N	WO 2004/105140 1							/2/2004	PCT		H01L 29/786				Abstract Only		
	-A.O	EP	14:	204	14			Ар	rll 6, 2003	EP		-G11C.1	3/O2 H01L 51/		1/30	N/A		
	A.P.	EP 1 361 608 11						11	/12/2003 EP			H01L 21/768 H01L 2		-H01L 23	3/532	-N/A		
	A.Q																	
									UMENTS (Incl						_			
55	A.R	Z.I Pro	Re	en, " rties	Larg	ge A Nov	uray el M	s of lateria	Well-Aligned Cals, Page 263-	arbon N 267, Feb	anotubes", Pro . 27 - Mar. 6, 1	ceedings 999, Kircl	of 13th Intenberg / Tirol,	mational Austria	Winter :	School on Electronic		
	A.S	Ch	oi e	t al.	, <u>U</u> n	nited	Sta	ites F	Published Appl	ication N	lo. 2002/O0019	905 A1, P	ublication Da	ite: 1/3/2	002			
75	A.T	Fu	ruka	awa	et a	ıl., <u>L</u>	Inite	ed Sta	ates Patent Ap	plication	Publication No	. US 200	5/O179029,	Publication	on Date:	August 18, 2005		
EXAMINER			Ź	2	, ,		L	1	_		DATE CON	SIDERED	/11					
EXAMINER:	Initial If c	itatio	n α	onsi	dere	ed, v	whet	her c	or not in confor	mance.	Draw line throu	ugh citatio	n only if not	in confort	mance <u>a</u>	and not considered.		
Include a cop	y of this	orm	with	n ne	XI C	omi	ทบท	icatio	n to applicant.					Substitute	Disclos	sure Form (PTO-1449)		

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

DATE CONSIDERED

http://neep.nasa.gov/index_nasa.cfm/769/#synthesis, "Synthesis of CNT's"

B.T

EXAMINER

Sheet 3 (C) of 15 SERIAL NO. U.S. DEPARTMENT OF COMMERCE ATTY, DOCKET NO. **SUBSTITUTE FORM PTO-1449** 10/711,764 PATENT AND TRADEMARK OFFICE **IBM/319** (MODIFIED) **APPLICANT** INFORMATION DISCLOSURE STATEMENT BY APPLICANT Toshiharu Furukawa et al. **GROUP** FILING DATE (Use several sheets if necessary) October 4, 2004 2823 (37 CFR 1.98(b)) **U.S. PATENT DOCUMENTS** FILING DATE ISSUE **EXAMINER** IF APPROPRIATE **SUBCLASS** CLASS INITIAL PATENT NUMBER DATE **PATENTEE** Ç.A C.B C.C C.D C.E C.F C.G C.H C.I C.J C.K FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS TRANSLATION **COUNTRY OR DOCUMENT PUBLICATION** (YES/NO) **SUBCLASS** PATENT OFFICE CLASS DATE NUMBER C.L C.M C.N C.O C.P C.Q OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication) C-H. Klang, "Growth of Larger-Diameter Single-Walled Carbon Nanotubes," J.Phys. Chem. A 2000, 104, 2454-2456 C.R

E.Ploenjes, et al, "Single-Walled Carbon Nanotube Synthesis in CO Laser Pumped Monoxide Plasma". Oct 10, 2001 C.S Y.Mo, et al, "The growth mechanism of carbon nanotubes from thermal cracking of acetylene over nickel catalyst supported on alumina." 2001 Elsevier Science B.V C.T

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. include a copy of this form with next communication to applicant.

H.W.Zhu, et al, "Direct Synthesis of Long Single-Walled Carbon Nanotube Strands," 3 May 2002, Vol 296, Science D.S H.Cui, et al, "Growth behavior of carbon nanotubes on multilayered metal catalyst film on chemical vapor deposition." D.T Chemical Physics Letters 374 (2003) 222-228 DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

EXAMINER

E.R J.Li, et al, "Highly-ordered carbon nanotube arrays for electronics applications". Applied Physics Letters, Vol 75, Number 3, 19 July 1999

E.S Furukawa et al., United States Patent Application No. US2005/O130341, Publication Date: June 16, 2005

E.T Roesner et al., United States Published Application No. 2003/O132461 A1, Publication Date: 7/17/2003

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

Phillip G. Collins, et al., "Nanotubes for Electronics," Scientific American, pp. 62-69, December 2000

DATE CONSIDERED

August 16, 2001)

F.T

EXAMINER

Jun Li, et al, "Bottom-up approach for carbon nanotube interconnects", NASA Ames Research Center, Moffett Field, CA. G.T Rec'd 5. December 2002, accepted 31 January 2003 DATE CONSIDERED **EXAMINER**

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

Battelle No 12132, "Carbon Nanotube Arrays: Synthesis of Dense Arrays of Well-Aligned Carbon Nanotubes Completely H.S Filled with Titanium Carbide on Titanium Substrates* Aileen Chang, et al, "Integration of Nanotubes into Devices", National Nanofabrication Users Network, page 58, Stanford H.T Nanofabrication Facility DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered.

EXAMINER

Include a copy of this form with next communication to applicant.

SUBSTITUTE (MODIFIED)	FORM F	PTO-14	449				I.S. DEPARTM PATENT AND 1			ATTY.	DOCKET N	0.	SERIAL NO. 10/711,764		
•							LOSURE			APPLIC Toshiha					
		(L	Jse -	seven	al she	ets if n	ecessary)			FILING			GROUP 2823		
(37 CFR 1.98(I	b))							DATENT D	OCUMENTS						
		т—					1	TATENTO	OCUMENTS					FILING DATE	
EXAMINER INITIAL		F	AT	ENT N	NUMB	ER	ISSUE DATE		PATENTEE	CLASS		SUBCLASS		IF APPROPRIATE	
	I.A	\ 										 			
	I.B	Ш	1	\Rightarrow	H	_	-	ļ				<u> </u>			
	I.C		\perp	1	Ц	$^{\perp}$	<u> </u>								
	I.D														
	I.E														
	I.F						<u> </u>					1			
	I.G														
	1.H	П					1								
	1.1				Π						ļ <u>-</u>				
	I.J		1												
	I.K	\prod	1									<u> </u>			
				F	OREIG	N PA	TENTS OR PL	BLISHED	FOREIGN PA	ATENT A	PPLICATIO	NS		\.	
		DOCUMENT NUMBER					PUBLICATION DATE		COUNTRY O		CLASS	SUBCLASS		TRANSLATION (YES/NO)	
	I.L													· 	
	i.M														
	I.N										<u> </u>	<u> </u>			
	1.0														
	I.P														
	I.Q														
				(OTHE	R DOC	CUMENTS (Inc	duding Aut	nor, Title, Dat	e, Place o	of Publicatio	ก)			
	I.R	Z.Hu depo	ang ositi	1,:.Z.F on." A	Ren,	. "Grov I Phys	wth of highly or	iented cart J 73, Numb	oon nanotube oer 26, 28 De	s by plase cember 1	na-enhance 1998	d hot filar	nent che	mical vapor	
	I.S	G.S.	G.S. Duesberg et al., <u>Large-Scale Integration of Carbon Nanotubes Into Silicon Based Microelectronics</u> , Proceedings of the SPIE, Bellingham, VA, Vol. 5118, May 21, 2003												
	I.T	Furu	ıkav	va et a	al., <u>Ur</u>	ited St	tates Patent Ap	oplication P	Publication No	. US 200	5/O167655,	Publication	on Date:	August 4, 2005	
EXAMINER	50				<u></u>	1	1		DATE CONS						
EXAMINER: I	nitial if c	itation	cor	next	ed, wh	ether	or not in confor	mance. D	raw line throu	igh citatio	n only if not	in confor	mance <u>a</u>	nd not considered.	
modue a wp	y or uns	.0//// 4					to opprount	-				Substitute	Disclos	ure Form (PTO-1449)	

Won Bong Choi, et al, "Ultrahigh density nanotransistors by using selelctively gr own vertical carbon nanotubes", Applied Physics Letters, Volume 79, Number 22, 26 November 2001 J.S Bo Zheng, et al, "Efficient CVD Growth of Single-Walled Carbon Nanotubes on Surfaces Using Carbon Monoxide J.T Precusor", Nano Letters, xxxx Vol.0, No 0 A-D. American Chemical Society revised June 26, 2002 DATE CONSIDERED **EXAMINER**

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

EXAMINER

DATE CONSIDERED

Sheet 12 (L) of 15 U.S. DEPARTMENT OF COMMERCE SERIAL NO. ATTY, DOCKET NO. SUBSTITUTE FORM PTO-1449 10/711,764 PATENT AND TRADEMARK OFFICE (MODIFIED) **IBM/319** APPLICANT INFORMATION DISCLOSURE Toshiharu Furukawa et al. STATEMENT BY APPLICANT **GROUP FILING DATE** (Use several sheets if necessary) October 4, 2004 2823 (37 CFR 1.98(b)) U.S. PATENT DOCUMENTS FILING DATE **ISSUE EXAMINER** IF APPROPRIATE **SUBCLASS PATENTEE** CLASS INITIAL PATENT NUMBER DATE L.A L.B L.C L.D L.E L.F L.G L.H L.I L.J L.K FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS **TRANSLATION** DOCUMENT **PUBLICATION COUNTRY OR SUBCLASS** (YES/NO) PATENT OFFICE CLASS DATE NUMBER L.L L.M L.N L.O L.P L.Q OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication) Ploenjes et al., <u>Synthesis of single-walled carbon nanotubes in vibrationally non-equilibrium carbon monoxide</u>, Chemical Physics Letters 352 (2002) pp. 342-247 L.R Furukawa et al., United States Patent Application Publication No. US 2005/O129948, Publication Date: June 16, 2005

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

Choi et al., United States Published Patent Application No. US 2003/O230760, Publication Date: 12/18/2003

DATE CONSIDERED,

L.S

L.T

EXAMINER

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

DATE CONSIDERED /

M.T

EXAMINER

Sheet 14 (N) of 15 SERIAL NO. SUBSTITUTE FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE ATTY, DOCKET NO. 10/711,764 PATENT AND TRADEMARK OFFICE IBM/319 (MODIFIED) INFORMATION DISCLOSURE **APPLICANT** Toshiharu Furukawa et al. STATEMENT BY APPLICANT FILING DATE **GROUP** (Use several sheets if necessary) October 4, 2004 2823 (37 CFR 1.98(b)) **U.S. PATENT DOCUMENTS** FILING DATE ISSUE **EXAMINER** IF APPROPRIATE **CLASS** SUBCLASS PATENT NUMBER **PATENTEE** DATE INITIAL N.A N.B N.C N.D N.E N.F N.G N.H N.I N.J N.K FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS TRANSLATION COUNTRY OR **PUBLICATION** DOCUMENT (YES/NO) PATENT OFFICE CLASS SUBCLASS NUMBER DATE N.L N.M N.N N.O N.P N.Q OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

N.R Farmworth et al., <u>United States Patent Application No. 2003/O168683</u>, Publication Date: 9/11/2003

N.S Choi et al., <u>United States Patent Application No. 2003/O170930</u>, Publication Date: 9/11/2003

N.T Appenzeller et al., <u>United States Patent Application No. 2003/O178617</u>, Publication Date: 9/25/2003

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not in conformance. Draw line through citation only if not in conformance and not considered. Include a copy of this form with next communication to applicant.

Include a copy of this form with next communication to applicant.